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Muscle tone is not a well-defined term

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'When I use a word … it means just what I choose it to mean — neither more nor less.'

Lewis Carroll's Humpty Dumpty might well have been thinking of the word 'tone' while he was philosophising with Alice. Tone is a commonly-used term most notable for its ambiguity. Definitions of tone (e.g. Sanger et al.[1]) contain phrases and words which are themselves ill-defined, rendering them difficult to interpret or measure. For example, Sanger et al. define passive tone as 'resistance to passive stretch while a patient is attempting to maintain a relaxed state of muscle activity,' but what is

meant *precisely* by resistance to stretch? Any definition that contains words or phrases that are ambiguous will always give the individual clinician a little room for manoeuvre to create their own internalized, even subconscious, version of the concept.

You would think that having a shared concept which was a little different in each clinician's mind would be in some ways progress-limiting, frustrating or worse, counter-productive. However, having a loosely-defined concept, and accepting that other clinicians' internalized versions are not quite the same as your own, allows us to communicate with each other in broad terms without getting hung up on the detail. So, if a colleague says to me, 'I saw a child with excessive tone this morning,' I have a mental image of what that means, what that child might 'look' like. Useful, if we both understand the limits of the shared ambiguous concept.

Problems occur when we take concepts like tone and we try to measure something about them, like their psychometric properties. In their systematic review, Goo et al. have bravely attempted to do just that, but have they achieved their objective?[2] In fact, they have analysed the properties of the components of developmental scales that could only be very loosely associated with our ambiguous concept of tone. They claim, for example, that 21 components from the numerous developmental scales they reviewed were consistent with Sanger et al.'s definition of passive tone. Actually, they selected items that were based on observation, palpation, passive range of motion, *or* resistance to

stretch. These terms are not all consistent with Sanger et al.'s definition, insofar as passive range of motion is not the same thing as resistance to stretch. One might also argue that each of these terms have rather ambiguous meanings themselves and therefore might have a very different representation in each assessor's mind. No wonder then that most of the assessments of tone featured in this review had poor to fair validity, and that only one test achieved moderate levels agreement between raters. Perhaps even more concerning was the poor intrarater reliability (assessors didn't agree with themselves on retesting) which suggest that either the status of the participants is very variable, the measurements intrinsically variable, or that the concept in the assessor's head changes. In any case, the components of the developmental scales reviewed by Goo et al.[2] are likely to have limited value in charting neurological development and thus predicting developmental problems.

REFERENCES

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